

What is claimed is:

1. A method the increasing the boundary layer strength of workpieces manufactured of ceramic materials comprising the steps of:

- providing a workpiece, the temperature of which is not elevated above room temperature and which does not comprise Zirconia;
- providing a tool which has at least a partially rounded contour with a predetermined diameter;
- contacting the workpiece with the tool within a predetermined surface area, said predetermined surface area being less than the total surface area of the workpiece and being selected based upon the composition of the workpiece;
- producing a plastic deformation on the predefined surface area; and
- generating internal compressive strain within the workpiece in the vicinity of the predetermined surface area;
- wherein the predetermined diameter for the tool does not exceed a critical value ranging from about .1 mm to about 4 mm, the critical value depending upon the composition of the workpiece selected such that, upon contacting the workpiece with the tool, generation of damage in the form of brittle fracture processes in the predetermined surface is substantially avoided.

2. The method of claim 1 wherein the critical values preferably ranges from about .1 mm to about 1 mm.

3. The method of claim 1 wherein the tool has an inherent momentum and is directed onto the workpiece surface at rest, on which the boundary layer of the workpiece is deformed by introduction of the momentum of the tool.

4. The method of claim 1 wherein the workpiece surface is subjected to plastic deformation all over its surface by repeated blows of the tool or by the application of a plurality of tools acting upon the workpiece surface.

5. The method of claim 1 wherein the tool consists of a plurality of spheres, which are driven onto the workpiece surface by means of a blasting installation, operated on compressed air or on an airless blasting means.

6. The method of claim 6 wherein the material of the sphere consists of the same or a similar material as that of the workpiece to be machined on its surface.

7. The method of claim 1 wherein the tool comprises a hammer.

8. The method of claim 1 wherein the tool comprises a nail.

9. The method of claim 1 wherein the tool comprises a roller.

10. A method of increasing the boundary layer strength of workpieces manufactured of ceramic materials comprising the steps of:  
contacting a workpiece in which, the temperature has not been elevated above room temperature and does not comprise Zerconia, with a tool having a predetermined diameter and has at least a partially rounded contour within a predetermined surface area, said predetermined surface area being less than the total surface area of the workpiece and being selected based upon the composition of the workpiece;

wherein the predetermined diameter for the round contour tool does not exceed a critical value ranging from about .1 mm to about 4 mm, the critical value depending upon the composition of the workpiece selected such that upon contacting the workpiece with the round

contour tool, generation of damage in the form of brittle fracture processes in the predetermined surface is substantially avoided.

11. The method of claim wherein the critical values preferably ranges from about .1 mm to about 1 mm.

12. The method of claim 10 wherein the tool has an inherent momentum and is directed onto the workpiece surface at rest, on which the boundary layer of the workpiece is deformed by introduction of the momentum of the tool.

13. The method of claim 10 wherein the workpiece surface is subjected to plastic deformation all over its surface by repeated blows of the tool or by the application of a plurality of tools acting upon the workpiece surface.

14. The method of claim 10 wherein the tool consists of a plurality of spheres, which are driven onto the workpiece surface by means of a blasting installation, operated on compressed air or on an airless blasting means.

15. The method of claim 14 wherein the material of the sphere consists of the same or a similar material as that of the workpiece to be machined on its surface.

16. The method of claim 10 wherein the tool comprises a hammer.

17. The method of claim 10 wherein the tool comprises a nail.

18. The method of claim 10 wherein the tool comprises a roller.